

Fill in the names of each of the “families” above:

7. First ionization energy, electron affinity and electronegativity of the elements

1312 -73	First ionization energy / kJ mol^{-1} Electron affinity / kJ mol^{-1} 2^{nd} EA / kJ mol^{-1}																2372						
H 2.2	Element																						
520 -60	900	Electronegativity																801 -27	1086 -122	1402	1314 -141 +798	1681 -328	2081
Li 1.0	Be 1.6																	B 2.0	C 2.6	N 3.0	O 3.4	F 4.0	Ne
496 -53	738																	578 -42	789 -134	1012 -72	1000 -200 +640	1251 -349	1521
Na 0.9	Mg 1.3																	Al 1.6	Si 1.9	P 2.2	S 2.6	Cl 3.2	Ar
419 -48	590 -2	631 -18	658 -8	650 -51	653 -64	717	759 -15	758 -64	737 -112	746 -119	906	579 -41	762 -119	947 -79	941 -195	1140 -325	1351						
K 0.8	Ca 1.0	Sc 1.4	Ti 1.5	V 1.6	Cr 1.7	Mn 1.6	Fe 1.8	Co 1.9	Ni 1.9	Cu 1.9	Zn 1.7	Ga 1.8	Ge 2.0	As 2.2	Se 2.6	Br 3.0	Kr						
403 47	550 -5	616 -30	660 -41	664 -86	685 -72	702 -53	711 -101	720 -110	805 -54	731 -126	868	558 -29	709 -107	834 -101	869 -160	1008 -295	1170						
Rb 0.8	Sr 1.0	Y 1.2	Zr 1.3	Nb 1.6	Mo 2.2	Tc 2.1	Ru 2.2	Rh 2.3	Pd 2.2	Ag 1.9	Cd 1.7	In 1.8	Sn 2.0	Sb 2.1	Te 2.1	I 2.7	Xe						
376 -46	503 -14	538 -45	680	761 -31	770 -79	760 -14	840 -106	880 -151	870 -205	890 -223	1007	589 -19	716 -35	703 -91	812 -183	-270	1037						
Cs 0.8	Ba 0.9	La 1.1	Hf 1.3	Ta 1.5	W 1.7	Re 1.9	Os 2.2	Ir 2.2	Pt 2.2	Au 2.4	Hg 1.9	Tl 1.8	Pb 1.8	Bi 1.9	Po 2.0	At 2.2	Rn						
393 -44	509 -10	499 -34																					
Fr 0.7	Ra 0.9	Ac 1.1																					

8. Atomic and ionic radii of the elements

30		<div>Atomic radius / 10⁻¹² m</div> <div>Element</div> <div>Ionic radius / 10⁻¹² m</div>																				He																			
154 (1-)																																					Ne				
152	112																																								
Li	Be																																								
68 (1+)		30 (2+)																	88	77	70	66	64																		
																			B	C	N	O	F																		
																			16 (3+)	260 (4-)	171 (3-)	146 (2-)	133 (1-)																		
186		160																	143	117	110	104	99																		
Na	Mg																		Al	Si	P	S	Cl	Ar																	
98 (1+)		65 (2+)																	45 (3+)	42 (4+) 271 (4-)	212 (3-)	190 (2-)	181 (1-)																		
231	197	160	146	131	125	129	126	125	124	128	133	141	122	121	117	114																									
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																								
133 (1+)		94 (2+)	81 (3+)	90 (2+) 68 (4+)	88 (2+)	63 (3+)	80 (2+) 60 (4+)	76 (2+) 64 (3+)	74 (2+) 63 (3+)	72 (2+)	96 (1+) 69 (2+)	74 (2+)	62 (3+)	53 (4+) 272 (4-)	222 (3-)	202 (2-)	196 (1-)																								
244	215	180	157	141	136	135	133	134	138	144	149	166	162	141	137	133																									
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																								
148 (1+)		110 (2+)	93 (3+)	80 (4+)	72 (3+) 64 (5+)	68 (4+)	65 (4+) 37 (7+)	68 (3+) 62 (4+)	67 (3+) 60 (4+)	86 (2+) 62 (4+)	126 (1+)	97 (2+)	81 (3+)	112 (2+) 71 (4+)	245 (3-)	222 (2-)	219 (1-)																								
262	217	188	157	143	137	137	134	135	138	144	152	171	175	170	140	140																									
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn																								
167 (1+)		134 (2+)	115 (3+)	76 (4+)	64 (5+) 72 (6+)	66 (4+) 42 (6+)	63 (4+) 38 (7+)	63 (4+) 39 (8+)	68 (3+) 63 (4+)	80 (2+) 63 (4+)	137 (1+) 85 (3+)	127 (1+) 110 (2+)	150 (1+) 93 (3+)	120 (2+) 84 (4+)	120 (3+) 76 (5+)	94 (4+) 67 (6+)	62 (7+)																								
270	220	188																																							
Fr	Ra	Ac																																							
180 (1+)		148 (2+)	112 (3+)																																						

Looking at the graph as atomic number increases, what trend does this atomic radius follow?

What is the electron shielding effect? Use a diagram to support your statement:

What happens the atomic radius of Cations? Why? Use an example to support:

What happens to the atomic radius of anions? Why? Use an example to support:

What does the term effective nuclear charge mean?

What does it mean for a group of ions to be isoelectronic?

Melting/Boiling Points:

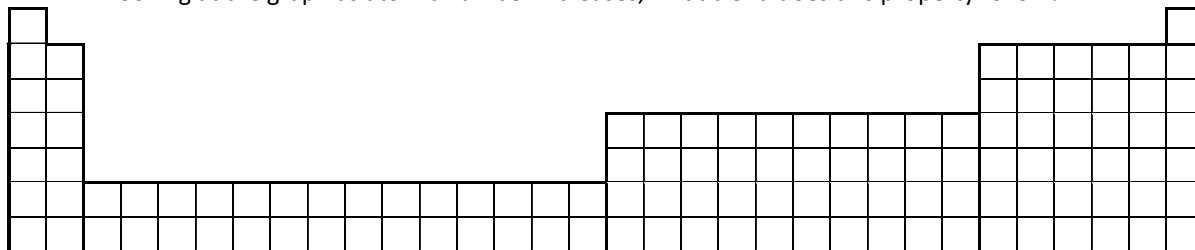
6. Melting points and boiling points of the elements

14 H 20	<div>Melting point / K</div> <div>Element</div> <div>Boiling point / K</div>															1 He 4	
454 Li 1615	1551 Be 3243											2573 B 2823	3925 C 5100	63 N 77	55 O 90	53 F 85	25 Ne 27
371 Na 1156	922 Mg 1380											933 Al 2740	1683 Si 2628	317 P 553	392 S 718	172 Cl 238	84 Ar 87
336 K 1033	1112 Ca 1757	1814 Sc 3104	1933 Ti 3560	2163 V 3653	2130 Cr 2943	1517 Mn 2235	1808 Fe 3023	1768 Co 3143	1728 Ni 3003	1356 Cu 2840	693 Zn 1180	303 Ga 2676	1210 Ge 3103	1090 As 886	490 Se 958	266 Br 332	116 Kr 121
312 Rb 959	1042 Sr 1657	1795 Y 3611	2125 Zr 4650	2740 Nb 5015	2883 Mo 5833	2445 Tc 5150	2583 Ru 4173	2239 Rh 4000	1827 Pd 3243	1235 Ag 2485	594 Cd 1038	429 In 2353	505 Sn 2543	904 Sb 2023	723 Te 1263	387 I 457	161 Xe 166
302 Cs 942	998 Ba 1913	1194 La 3730	2500 Hf 4875	3269 Ta 5700	3683 W 5933	3453 Re 5900	2973 Os 5570	2683 Ir 4403	2045 Pt 4100	1337 Au 3353	234 Hg 630	577 Tl 1730	601 Pb 2013	544 Bi 1833	527 Po 1235	575 At 610	202 Rn 211
300 Fr 950	973 Ra 1413	1323 Ac 3473															

Looking at the graph as atomic number increases, what trend does this property follow?

Reactivity:

Looking at the graph as atomic number increases, what trend does this property follow?



What conclusions can you make from the Brainiac Video?

You will need to compile each of your graphs, include the raw data used, with titles, keys, and brief explanations of each trend.